BELLMON ANALYSIS: IMPACT OF PL480 TITLE II GRANT FOOD AID ON INDIAN AGRICULTURAL PRODUCTION AND MARKETS

U.S.A.I.D./New Delhi
December 1998

TABLE OF CONTENTS

CHARTS AND TABLES

PAGE

MISSION OVERVIEW

The U.S. food assistance program in India is the largest U.S. program worldwide, consisting of over $90 million in commodities, including freight and other charges, in FY'98. The program is managed by the Cooperative Assistance for Relief Everywhere – CARE and by the Catholic Relief Services – CRS. An additional small amount of U.S. assistance ($6 million) is being provided through the World Food Program. The CARE program is the larger of the two private voluntary (PVO) programs, comprising approximately two-thirds of the total and focuses on support for the Indian government's Integrated Child Development Services (ICDS). India's Integrated Child Development Services, the world's largest outreach program, provides basic nutrition and health services to approximately 7 million children and women. Catholic Relief Services program is managed by a network of 2,500 Indian grassroots and parish organizations reaching deep into some of India's most impoverished hamlets and slums, to underprivileged women and girls, orphans, widows and some of the world's most destitute people..

Corn-soya blend and bulgur wheat totaling 167,460 MT were provided under the program in FY'98. Approximately 19,710 MT of vegetable oil was provided in the direct feeding program. An additional 5,000 MT of vegetable oil, received under the CIDA program by CARE was sold through the National Dairy Development Board., the proceeds being used to assist in program management.

Public Law 480, commonly known as PL 480, provides for concessional sales and grants of United States commodities, to countries constituting potential markets in the case of concessional sales, or which are chronically food insecure or facing emergency situations in the case of grants. Section 403 (a) (1) of Public Law 480 requires that "adequate storage facilities will be available in the recipient country…to prevent the spoilage or waste of the commodity." Sections 403 (a) (2) and (b) require that "The Secretary or the Administrator, as appropriate, shall ensure that the importation of United States agricultural commodities and use of local currencies for development purposes will not have a disruptive impact on the farmers or the local economy of the recipient country." Together these sections of the PL480 Law make up what is known as the Bellmon Amendment, named for their Senate sponsor. Responsibility for concessional sales (Title I) is assigned to the Secretary of Agriculture while grant food aid, except for 416 (b) surplus disposal programs and Food For Progress, are the responsibility of the Administrator of U.S.A.I.D. India has benefited from both grant and concessional programs.

Authority for making the "Bellmon" determination is delegated by the U.S.A.I.D. Administrator to the Director of the Office of Food For Peace. In recent times analysis has been prepared by PVO's, consultants or U.S.A.I.D. analysts. The Mission Director in the recipient country reviews the analysis and makes a recommendation on which the final determination is based.

.

This Bellmon analysis was prepared by Stephen Sposato, USAID/BHR Economist, in coordination with N.M. Prusty, Director, Commodity Management, CARE/India, Ranjan Sinha, Agricultural Economist, CARE/India and Hema Ramaswamy, Deputy Office Director, Office of Social Development, USAID/India. The team visited industry associations, parastatal agencies, producers and cooperating sponsors over a three week period in December 1998.

The report's findings are divided into several parts. The vast majority of the food assistance program in India consists of direct feeding programs to the poor integrated with the provision of health services and health education.. A brief review of these programs, prior evaluations and summary reports were used to evaluate the targeting of feeding done under these programs. Food adequately targeted to poor undernourished families should represent additional caloric supplies to the family and not result in disruptions of any purchases the family might otherwise make. The extent of poverty and undernourishment in the areas targeted by CARE and CRS programs and the quality of the targeting makes it unlikely that any market disruption occurs as a result of the direct feeding programs.

While the quantity of vegetable oil monetized is relatively small in comparison to the direct feeding programs, its sale in the market place makes it more susceptible to disrupt normal marketing and production patterns. We examined carefully therefore aggregate damand for vegetable oil in India, responsiveness of agricultural production to price and current market conditions. We also spoke with the major processors and farmer's associations, the groups most likely to be affected. Scenarios considering marketings of current levels of 6,800 MT and an increase to up to 50,000 MT were considered for both refined and crude and degummed vegetable oil. It was the unanimous view of those contacted that at the levels contemplated monetization of PL480 vegetable oil would not affect local market conditions if care were taken to sell it at prevailing prices. Their views supported our findings from the data.

Port and storage facilities are monitored on an on-going basis by the cooperating sponsors CARE and CRS as well as by USAID/India. Capacity to handle increased commercial vegetable oil imports has recently been expanded in several ports and excess capacity currently exists. Neither port or storage facilities were considered to be issues for the size program contemplated. As always with food aid programs good management and planning are prerequisites if these findings are to be validated.

OVERALL NUTRITIONAL SITUATION

Despite major achievements since independence in agricultural production and most social and economic indicators, India continues to be ranked as one of the twenty poorest countries of the world and given the sheer size of the population and distribution of wealth a major resevoir of the world's poor.

The poorest 30% of the Indian population consumes on average 1681 adult equivalent calories per capita well below the 2200 recommended for urban and 2400 for rural areas.[1] A somewhat greater level of recommended nutritional intake would be suggested for light to heavy physical labor. Some reports place caloric deficiencies for women in low income groups at as much as 1000Kcal. Table I shows a breakdown of the Indian population with recommended caloric levels by age and gender group. It illustrates the effects of age distribution of the population on total caloric requirements.

TABLE I: INDIA, Population Distribution and Recommended Caloric Intake, 1992-93 [2]

Pop. Age	% Males	Calories	% Females	Calories	Total Calories
0 –4	12.2	1600	12.2	1600	1600
5 – 9	13.5	1600	13.2	1600	1600
10 – 14	12.2	3000	11.9	2350	2679
15 – 19	9.9	3000	10.0	2350	2673
20 – 24	8.6	2900	9.5	2100	2480
25 – 29	7.9	2900	8.4	2100	2488
30 – 34	6.5	2900	6.7	2000	2443
35 – 39	6.2	2900	5.8	2000	2465
40 – 44	4.8	2700	4.4	1900	2317
45 – 49	4.1	2700	3.9	1900	2310
50 – 54	3.3	2500	2.9	1800	2172
55 – 59	2.7	2500	3.5	1800	2104
60 – 64	2.9	2350	3.0	1700	2290
65 – 69	2.0	2350	1.8	1700	2042
70 +	3.1	2200	2.7	1600	1920
Total	100	2495	100	1945	2220[3]

[1] Levinson, James F, India – Sector Review of Nutrition Programs, Tufts University, April 1998; p.1.
[2] International Institute for Population Sciences, National Family Health Survey 1992-93, Bombay, August 1995, p.41; USAID funding.
[3] Weighted for 1.059 Male/female ratio equals 2,227 total calorie requirement.

Malnutrition problems while most acute among the lowest 30% in income terms, continue to be prevalent through the poorest 7 rural and 6 urban deciles.[4] In spite of the reduction in the incidence of poverty from 55 % in 1973-74 to 39% in 1987-88, 17% of children below the age of 5 continue to suffer from severe forms of malnutrition. The rate of moderate to severe malnutrition among children under 5 years of age is 63%, more than double that of Sub-Saharan Africa and almost two and one half times that of East Asia and the Pacific.[5] Indeed 73 million malnourished children, 40% of the world's 184 million estimated, live in India.

Table II shows nutritional status of children under 4 from the 1993/94 National Family Health Survey. While time frames and aggregations differ somewhat between sources the data from the comprehensive National Family Health Survey support the overwhelming conclusion of the magnitude of nutrition problems among India's poor.

TABLE II: INDIA, Nutritional status of Children Under Four Years of Age, 1992-93[6]

[% of Total Children 1- 4]

Category	Weight - for - Age		Height - for - Age		Weight – for - Height	
	below 3 SD	Below 2 SD	Below 3 SD	below 2 SD	below 3 SD	below 2 SD
Male	20.2	53.3	28.4	52.3	3.7	18.8
Female	21.0	53.4	29.4	51.7	2.6	16.1
Rural	22.4	55.9	30.9	54.1	3.2	18.0
Urban	14.8	45.2	22.0	44.8	2.9	15.8
Total	**20.6**	**53.4**	**28.9**	**52.0**	**3.2**	**17.5**

[4] Levinson, James F, India – Sector Review of Nutrition Programs; op cit, p.1.
[5] Govt. of India, Planning Commission (1993) Expert Group on Estimation of Proportion and Number of Poor; UNICEF (1995) The Progress of Indian States; GOI (1991) Annual Report of Ministry of Health and Family Welfare; Int'l. Institute for Population Sciences (1995) National Family Health Survey; UN Administrative Committee on Coordination (1993) Subcommittee on Nutrition, ACC/SCN Second Report on The World Nutrition Situation, Vol. II, cited in:
Bhalla, G.S. and Krishnamurty, K.G., Food Security Scenario and Role of Supplementary Food Programs: A Summary, Centre for The Study of Regional Development Jawaharlal Nehru Univ., New Delhi, April 1996, p.2.
[6] International Institute for Population Sciences, National Family Health Survey 1992-93, op cit, p.283-284.

Given the magnitude of India's nutrition problems targeting direct feeding to undernourished households should not be problematic. A 1994 evaluation of the CARE program points to the "striking magnitude of the nation's (India's) nutritional deficiencies" and goes on to say, "the magnitude of the nutritional problems of India are greater than those of even the poorest sub-Saharan African countries.[7] The study reports this to be the case, " for both protein-energy malnutrition and micro-nutrient deficiencies such as iron, vitamin A and iodine".

While a number of studies criticize the Government of India's Public Distribution System (PDS) for subsidizing middle class consumption, the nature of CARE and CRS' programs orients them largely to the poor, and within the poor to mothers and young children.[8] In the case of CARE, assistance is provided to the Integrated Child Development Services (ICDS) at the village or "Anganwadi Centers" while CRS programs reach a variety of poor constituencies including through Mother Theresa's Missionary's of Charity, among many others. Both focus principally on rural and in the case of CRS, some tribal areas, where the bulk of the poor are found. Balla and Krishanamurty report that while 40 percent of households were considered poor in 1987-88, 73 percent of these households were found in rural areas.[9]

Speaking of the focus of the CARE and CRS programs Balla and Krishanamurty go on to say[10]:

> "The two agencies that operate under the USG supported Title II, Food Aid Programme in India are CARE and CRS whereas WFP is a multilateral recipient of Title II, Food Aid. In terms of total quantum, the contribution made by these agencies is not large. However, since many of their programmes are concentrated on the provision of food to children, and pregnant and nursing mothers among the most deprived sections like the tribals and agricultural labourers in the less developed States, the food programmes, although modest in scale, have made significant contribution."

Approximately 7 million of the poorest in India are receiving critical daily relief from these programs. While Levinson criticizes the ICDS for not meeting health and nutrition goals of targeted children and pregnant and lactating women, one of the reasons advanced for not meeting these goals is that the program is "using food … to address major food security needs unmet by other policy and programmatic means"[11]. The

---

[7] Grant John et al, Impact Evaluation: CARE-India's Title II Program, Dec. 20, 1994 USAID/BHR, p.3.

[8] See inter alia, Bhall and Krishanamurty, op cit; Levinson, op cit; Gulati, A., Sharma, P., and Kahkonen, S., The Food Corporation of India: Successes and Failures in Indian Foodgrain Marketing, IRIS-India Working Paper No. 18, August 1996;Sarma, J.S. and Gandhi, V.P., Production and Consumption of Foodgrains in India: Implications of Accelerated Economic Growth and Poverty Alleviation, IFPRI Rept. #81 July 1990.

[9] Bhalla and Krishanamurty, op cit, main report, p.4.

[10] ibid. p.2.

[11] Levinson, op cit p.11.

phenomena Levinson is referring to is the use of ICDS food to support general family nutrition. It appears to be his conclusion that the sharing of food with other family members occurring in the ICDS program, takes place as a direct response to general family nutritional and food security problems. In the Title II area, this dilution does not seem to be as problematic because CSB is seen as a special food for young children. While perhaps an issue for program design Levinson's conclusion reinforces the observations of other reviewers that the food aid programs are reaching needy "food insecure" segments of the population and not disrupting normal marketing as would occur if program food were leaking to non-vulnerable groups.

The extensive USAID evaluation of the CARE program does not appear to have uncovered any leakage of food to non-vulnerable groups. The evaluation had this to say of the feeding aspects of the program[12]:

> "ICDS is a visionary program with substantial potential impact on the health and nutritional status of the vulnerable poor. The GOI is committed to the improved implementation of ICDS, and devotes considerable resources to the program.
>
> Food is very important to ICDS, but food alone is not enough for nutritional impact."

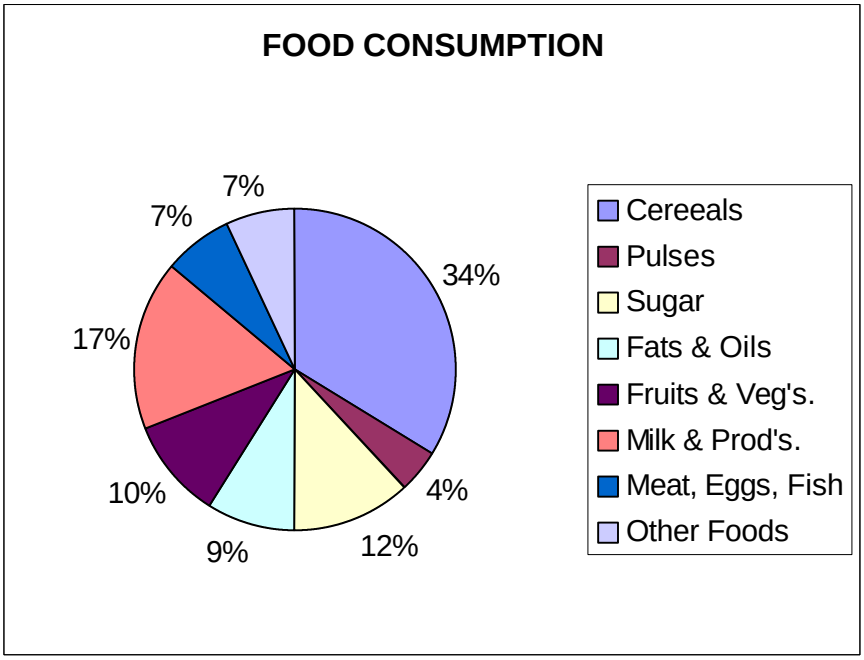
The criticism of the food components of the program found in the USAID evaluation of CARE, is again one of insufficient impact of the food on targeted groups, according to the evaluation resulting from inadequate ancillary inputs for health care and nutrition information. The criticism found in Levinson and others of diversion of food to other family members is also reviewed and supported in the USAID evaluation, though in a somewhat attenuated fashion. Most importantly for our conclusions, what diversions of food that are found by the CARE evaluators as well as by Levinson, occur within poor food insecure families and do not represent a targeting problem of food reaching those without need or entering the market.

[12] Grant et al, op cit, p. ii.

HOUSEHOLD NUTRITION

Indian households spend approximately 50.5 % of their income on food and another 4.4 % on beverages and tobacco.[13] Cereals constitute approximately 36% of expenditures as shown in Graphic I: Food Consumption. This level of expenditure, while high, compares favorably with other developing countries with similar, or in many cases, less severe nutritional problems. It is unclear why Indian statistics show only half of disposable income spent on food while such severe nutritional problems persist for large portions of the population. Whether the anomaly is due to statistical inaccuracy, peculiarities of Indian pricing, unavailability of food, or some as yet unaccounted for factor has not been determined . The extensive welfare safety net provided by the "Public Distribution System" and ICDS program would seem to support relatively favorable comparative nutritional results at similar levels of expenditure. That this is not the case, or at least, appears not to be the case is difficult to explain.

GRAPHIC I: India, Food Consumption, by expenditure category



An aspect of the problem is the within household distribution of food. Disfavoring of women and children, as noted above, explains some of the inconsistency found between the level of household expenditure and extent of the malnutrition problems. We do not believe, however, that the full extent of the discrepancy is explained by this factor.

Consumption of most food stuffs except for cereals are significantly below recommended daily requirements. According to the National Institute of Nutrition in a

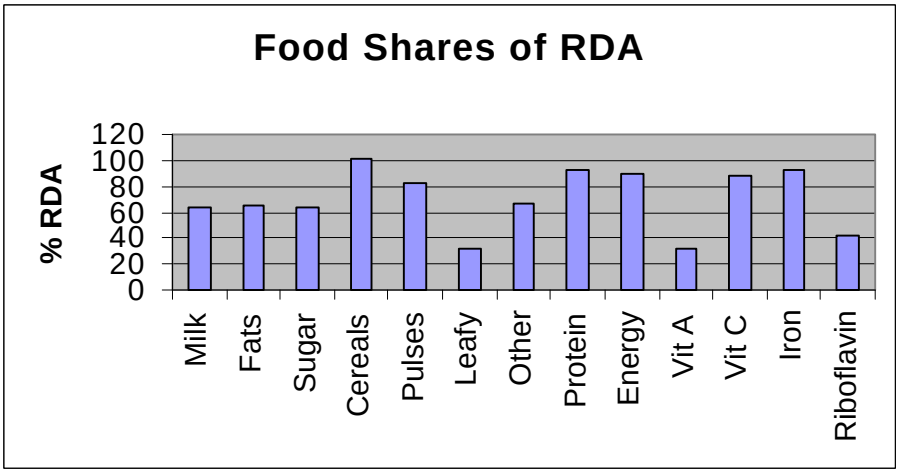
[13] India, Central Statistical Organization, Nat'l. Acct. Statistics, 1993 & 94 .

1996 survey of 57,703 households and 326,000 individuals, consumption of cereals at 484 grams per person per day, slightly exceeded the recommended daily allowance(RDA) of 480 grams, vitamin C intake of 35 milligrams per day was satisfactory, although slightly below the RDA of 40 mg, iron at 26 mg was close to the RDA of 28 and protein intake of 56 grams was close to an RDA of 60 grams, while all other basic food stuffs were below or significantly below their RDA.[14]

Graph II shows foods as a percent of RDA. Milk products at 95 grams compare to an RDA of 150, fats and oils at 13 grams show a significant increase in recent years but remain well below the RDA of 20 grams, sugar and jaggery at 23 grams compare to 30 grams RDA, pulses and legumes, the main source of proteins for vegetarians and many non-vegetarian families, at 33 grams is below the RDA of 40 grams, green leafy vegetables at 13 grams compare to 40 g RDA, other vegetables at 40 g compare to 60g RDA. The study notes fruit consumption of 22 grams. In terms of actual proteins, energy and micronutrients, protein intake was about equal to the RDA although declining in recent years, energy intake of 2172 compares to an RDA of 2425, Vitamin A at 266 mg. was well below the RDA of 800 mg. while riboflavin at 0.6 mg. compares to 1.4 mg. RDA.

This data supports the general nutrition data and data from other sources, as to the widespread and acute food and nutrition problems within the Indian population. Vegetable oil consumption is considerably higher than in other studies but still significantly below both the RDA and that of comparable developing countries. Clearly there is a need for food aid and efforts to enhance food security.

Graph II: India, Shares of Recommended Daily Allowance, by food



[14] National Institute of Nutrition, National Nutrition Monitoring Bureau, Indian Council of Medical Research, Hyderabad, 1997.

ECONOMY

Especially in the early Nehru years "Indian socialism" followed an economic model based in part on Soviet development theory favoring investment in heavy industry first. State involvement in directing the economy was pervasive through outright ownership as well as intensive management of economic activity through direct regulatory intervention, taxation and incentive policies. The five year plan set the overall framework for economic orientation. Foreign ownership and investment was highly regulated, external tariffs high and affording considerable protection. Indian industry developed on its own, isolated from world markets and protected through external measures.

There were many successes of the Indian model of development although at high cost. India developed modern industries in almost every field of human endeavor, although often at costs higher and with technologies inferior to world standards. Growth rates also lagged those of many competitors, notably China and East Asia, although as these economies started to falter in the past year, India was spared their sharp economic decline. Table III shows economic sector shares and growth by major sector in the Indian economy.

TABLE III: India, Economic shares and Growth, by sector[15]
[%GDP, %Growth]

Sector GDP	**1975**	**1985**	**1995**	**1996**
Agriculture	40.5	33.0	27.9	27.8
Industry	23.7	28.1	30.1	29.2
Manuf.	16.7	17.9	19.7	20.1
Services	35.8	38.8	42.1	43.0
Private Consumption	70.2	67.8	66.8	66.4
Govt. Consumption	9.4	11.1	10.5	10.5
Imports	6.6	9.1	15.6	15.3
Growth	**1975-85**	**1986-96**	**1995**	**1996**
Agriculture	2.5	3.6	-0.1	5.7
Industry	5.3	6.6	11.6	7.0
Manuf.	5.5	6.7	13.6	8.1
Services	5.1	6.7	8.8	7.4
Pvt. Con.	4.5	4.8	2.6	6.8
Govt. Con.	6.5	3.9	5.1	7.2

[15] International Finance Corp.(IFC), IBRD, India – Country Assistance Strategy, R97-293/1, Dec. 23, 1997, Annex 3, p1.

The share of government consumption in total GDP, 11.1% in 1985 falling to 10.5% in 1996 is somewhat misleading given the central role of the GOI in the planning of India's economic development.

The basic orientation of the Indian economy from one of government directive to a more private oriented less regulated one began to change in the early 1990's. The 1991 foreign exchange crisis and ensuing rise of the Rupee set the stage for a gradual economic liberalization. With prodding from the IMF who was insisting on liberalization to provide bridge financing for the crisis, India embarked on an approved "IMF Structural Adjustment Program" which included privatizations, lower tariffs, deregulation of many sectors and increasing openness to foreign investment. Reforms have been very unsystematic, however, as many vested interests and patterns of bureaucratic control remain 'de rigeur' in the Indian bureaucratic polity. Nevertheless, growth during this period has been substantial averaging above 6%. We shall see further on in our examination of the oilseeds sector how the pattern of partial liberalization in a still highly regulated market impedes growth.

AGRICULTURE

India lies between 8 and 38 degrees North latitude, between 68 and 97 degrees East longitude, with an area of 3,287,263 sq. km. This "subcontinent" is protected from winter winds coming off the Central Asian plains by the Himalayas. Its southern areas are marked by a tropical monsoon climate while the Northern plains have three distinct seasons a cold season from October to March, the hot season from April to mid-June and the rainy season from mid-June to October. Temperatures during the cold season remain above freezing limiting certain fruit and grain cultivation which require a hard winter freeze while permitting other crops which do not tolerate below freezing temperatures.

Agricultural activity, 28% of gross domestic product (GDP), represents an important, albeit declining share of the Indian economy. It represents a significantly larger share of total employment, roughly 67%, as many seasonally employed and partially employed rural inhabitants contribute to the sector on a sporadic basis.

Agriculture's share in total economic activity represented 40% of GDP as recently as 1975 and 33% a decade later in 1985. Table III above shows relative share of GDP by economic sector and compares these to growth rates for the respective sectors. Even with the rapid growth effects of the "green revolution" in the 1970's and 1980's, agriculture's rate of growth was still slower than some of the leading sectors as industry and manufacturing, and in recent years is growing at a considerably slower pace.

Using criteria of geographic location, agroclimatic conditions and cropping patterns, India's 31 States and Union Territories can be divided into six broad regions as seen in Table IV.[16]

TABLE IV: India, Composition of Agricultural Regions

Region	States & Union Territories	% Population	% Foodgrains
Northern	Punjab, Haryana, Jammu and Kashmir, Himachel Pradesh, Delhi, Chandigarh	6.8	15.9
Uttar Pradesh	Uttar Pradesh	16.2	19.2
Central	Madhya Pradesh, Rajasthan	12.6	14.6
Western	Maharashtra, Karnataka, Gujarat, Goa, Daman and Diu, Dadra & Nagar Haveli	19.7	15.7
Eastern	Bihar, West Bengal, Orissa, Assam, Tripura, Manipur, Meghalaya, Arunchal Pradesh, Nagaland, Sikkim, Mizoram, Andaman and Nicobar Islands	26.0	21.7
Southern	Andrha Pradesh, Tamil Nadu, Kerala, Pondicherry, Lakshadweep	18.7	13.0
All India		100	100

TableV shows crop yields, area and agricultural inputs by major region .[17] Some of the diversity in agricultural conditions can be observed from the table. In addition to the length of the growing season and temperature conditions, the length and intensity of the monsoon rains, is a major determinate of agricultural cropping in areas where irrigation is not available. Many regions in India obtain two crops, the main or Kharif and Rabi or second crop. Limited areas, and some irrigated areas, can obtain three crops. Largely as a result of increased irrigation, double cropped area has increased 50 % from 1965 to 1990 and now accounts for 27 % of agricultural area under cultivation[18]. Rainfall both in terms of sufficiency and reliability is a major risk factor in most non-irrigated areas. The transition from more tropical crops, to semi-temperate crops

[16] Sarma, J.S. and Gandhi, V.P., Production and Consumption of Foodgrains in India: Implications of Accelerated Economic Growth and Poverty Alleviation, IFPRI, Washington DC, July 1990, Rept. # 81, p.22.
[17] ibid. p. 22.
[18] Lele, Uma and Bumb, Balu, South Asia's food Crisis: The Case of India, World Bank, Wash. D.C., p.18.

occurs regularly from south to north. Coastal areas receive greater rainfall and consequently are more likely to have second and third growing seasons.

TABLE V: India, Regional Agricultural Yields and Inputs

Region	Grain. Yield/Ha.	Area All Crops	Area Foodgrain	High Yield Varieties	Fertilizer Use	Irrigated Area
	- kg. -	Mln. ha.	Mln. ha.	% Area	Mln. MT	Mln. ha.
Northern	1,940	7.8	8.4	16.2	19.1	19.6
Uttar Pradesh	1,219	16.0	16.2	20.5	21.3	22.9
Central	617	22.1	23.8	11.7	6.2	12.5
Western	803	23.0	19.9	19.2	20.9	13.2
Eastern	1,061	19.0	20.9	17.9	10.8	15.6
Southern	1,227	12.1	10.9	14.5	21.8	16.2
All India	1,023	162.2	126.7	46.1 (ha.)	5.5	49.6

Table VI[19] shows the rates of growth in agricultural area, yield and production, prior to during and after the "green revolution". Agricultural area has expanded at a decelerating rate throughout the entire period, as more and more of the Indian land mass has been brought into production, and has actually declined slightly since 1984/85.. Yields increased inversely due to the effects of the green revolution taking place from the late 1960's through early 1980's.

TABLE VI: India, Agricultural Growth Rates in Area, Yield and Production

Category/Period	Total Cereals	Pulses	All Food Grains
Area			
1949/50 – 1964/65	1.30	1.87	1.41
1967/68 – 1975/76	0.31	0.77	0.40
1975/76 – 1984/85	0.39	-0.32	0.19
1984/85 – 1994/95	-0.01	-0.26	-0.23
Yield			
1949/50 – 1964/65	1.77	-0.41	1.41
1967/68 – 1975/76	1.90	-1.27	1.50
1975/76 – 1984/85	2.45	0.11	2.28
1984/85 – 1994/95	3.20	0.02	3.03
Production			
1949/50 – 1964/65	3.09	1.44	2.84
1967/68 – 1975/76	2.22	-0.51	1.91
1975/76 – 1984/85	2.77	-0.22	2.48
1984/85 – 1994/95	2.89	1.64	2.78

[19] Sarma and Gandhi, op cit, p32.; 1984/85 –1994/95 from: National Accounts Statistics.

The dramatic increase in agricultural inputs which, with improved varieties, were at the base of the "green revolution, is shown in Table VII [20]. The high yielding wheat and rice varieties, which are at the base of the "green revolution", require a high level of inputs to reach their peak yields. Without sufficient water additional inputs are unable to be absorbed by the plants and their use may actually inhibit plant growth. "Green revolution" type agricultural productivity gains and the intensification of inputs necessary to support them, are difficult to extend into many additional areas in the subcontinent. Insufficient rainfall or irrigation is available in many areas to support the level of input use which the high yielding "green revolution" wheat and rice varieties require to be prolific. Even in those areas currently under intensive production, falling water tables, nitrogen pollution and other problems associated with intensive agriculture are becoming more and more common making additional gains problematic and maintaining current production levels difficult.

TABLE VII: India, Agricultural Input Use, selected years

Period	Fertilizer (1,000 MT)	Irrigation (Mln. Ha.)	Improved Seed (MlnHa.)
1949/50 – 1951/52	18.07	18.00	0
1962/63 – 1964/65	281.48	23.53	0
1967/68 – 1969/70	907.42	27.87	8.82
1975/76 – 1977/78	2,458.4	34.50	34.79
1981/82 – 1983/84	4,996.41	38.69	49.24
1990	12,000.00	45.00	60.0 +

The expansion of total area at the expense of natural forests and unspoiled natural preserves has implications for any future strategy to feed the growing Indian population from domestic resources.

[20] Sarma and Gandhi, op cit. P. 35.; 1990 from, Lele, Uma and Bumb, Balu, South Asia's food Crisis: The Case of India, World Bank, Wash. D.C., p.18.

OILSEEDS

Since the inception of GOI policy attention to the oilseeds sector in the late 1970's culminating in an "Integrated Oilseeds Policy" in the late 1980's, to the gradual demise of the policy of import substitution and replacement by a somewhat more liberal regime in the 1990's, Indian oilseed production first increased dramatically before undergoing a gradual decline. Table VIII shows the share of Indian oilseed production in agricultural production.

TABLE VIII: India, Value of Agricultural Output, major categories[21]

Category	1985 - 86	1990 - 91	1991 - 92	1992 - 93	1993 – 94
Rice (paddy)	17.1	15.4	16.4	15.8	16.7
Wheat	9.2	8.7	9.2	8.8	8.9
Oilseeds	6.3	10.6	10.2	9.4	9.3
Sugar	5.2	5.5	5.0	5.2	5.6
Livestock	24.0	24.6	25.4	26.2	26.4
Sub Total	61.8	64.8	66.2	65.4	66.9

An examination of area devoted to various crops paints a similar picture as is seen in Table IX:

TABLE IX: India, Area Under principal Crops, selected years[22]

	1979 - 1980		1986 - 1987		1993 - 1994	
Crop	Mln. ha.	%	Mln. ha.	%	Mln. ha.	%
Total	172.21	100	177.27	100	182.47	100
Foodgrain	127.25	74	127.30	72	122.49	67
Of which						
Rice	120.18	70	41.15	23	42.15	23
Wheat	22.09	13	23.23	13	24.26	13
Coarse	41.96	24	39.47	22	33.63	18
Pulses	23.14	13	23.44	13	22.45	12
Oilseeds	17.27	10	18.86	11	25.97	14
Cotton	8.04	5	7.29	4	7.51	5
Sugarcane	2.95	2	2.96	2	3.62	2

[21] World Bank, India Country Economic Memorandum, Five Years of Stabilization and Reform: The Challenges Ahead, August 1996, p. 86.
[22] World Bank, India The Indian Oilseed Complex: Capturing Market Opportunities, Vol. II, July 1997 Annex 2 p. 22.

A more detailed breakdown by period shows total oilseed area peaking at between 25 and 26 mln. ha. in the early 1990's while production levels off at about 22 mln. tons average shortly thereafter. Table X shows average area and production for five year periods beginning in 1974.

TABLE X: India, Oilseed Area, Production and Percent Irrigated[23]

Years	Area Mln. Ha.	Production Mln. MT	% Irrigated Area
1974/75- 78/79	17.1	9.59	9.2
1979/80- 83/84	17.98	10.58	15.02
1984/85- 88/89	19.72	13.14	19.54
1989/90- 93/94	24.99	19.15	23.0
1994/95- 96/97	26.1	22.89	25.0

While area increased by 52.6% over the period, production increased by 138.6% due to rapidly growing yields. Both expansion in irrigated area and introduction of soyabeans and rapeseed, oilseeds with good potential in the ecology of the sub-continent, contributed to this growth, sometimes referred to as the "yellow revolution". While productivity has continued to grow in the 1990's without some of the price support implicit in the earlier "integrated oilseeds policy", area growth has slowed.

TABLE XI: INDIA, Vegetable Oil Production and Supplies, selected years[24]

[Million tons]

YEAR	OILSEEDS PRODUCTION	DOMESTIC SUPPLY	IMPORTS	CONSUM-PTION	% SELF-SUFFICENCY
1986 - 87	11.27	3.87	1.50	5.37	72
1987 - 88	12.65	3.99	1.82	5.81	69
1988 - 89	18.03	5.86	0.45	6.31	93
1989 - 90	16.92	5.68	0.69	6.37	89
1990 - 91	18.61	6.37	0.19	6.56	97
1991 - 92	18.60	6.49	0.34	6.83	95
1992 - 93	20.10	6.81	0.20	7.01	97
1993 - 94	21.50	6.93	0.33	7.26	95
1994 - 95	21.34	7.19	1.00	8.19	88
1995 - 96	22.43	7.22	1.48	8.70	83
1996 - 97	24.96	7.42	1.75	9.17	81
1997 - 98	23.69	7.00	2.08	9.08	77

[23]. Solvent Extractor's Association of India Data Bank, private communication

[24] ibid. , primary source from: Oilseeds Production Data – Directorate of Economics & Statistics.

Oilseed prices fell 21.7 % between 1990 and 1995 while overall crop prices increased 11.9 %.[25] Consumption has continued to grow throughout the period with both population growth and growth in the still low per capita consumption levels. As a result of these factors self-sufficiency peaked in the 1990- 94 period at 97% and has declined rapidly since as can be seen in Table XI above.

A number of policy measures explain the increase in prices during the run up to and early period of the "Integrated Oilseeds Policy". The primary factor was import protection through high tariffs and a restrictive import regime for vegetable oils or outright interdiction of imports in the case of oilseeds. A number of other measures contributed to promoting high oilseed prices relative to other crops but were considerably less important than the import regime.

Other measures included: price supports, although these were generally set below market prices they eliminated some of the risks associated with a more liberal regime; market stabilization, which was only exercised during brief periods and for limited quantities; PDS distribution, although from imports under PL 480 and from other commercial imports undertaken by the State Trading Corporation(STC), PDS distribution served to maintain consumption in spite of high domestic prices; a storage limitation designed to prevent hoarding; limitations on movement of oilseeds between States; the "Technical Mission on Oilseeds", a Ministry of Agriculture initiative, focusing government attention and resources on the oilseeds sector; the "small-scale reservation", limiting the size of processing plants for rapeseed and groundnuts with the exception of co-operatives; tax incentives for processors, although inconsistent State tax policies create many market inefficiencies; food and phyto-sanitary regulations interdicitng blending of vegetable oils; grading and marketing orders, along with other minor regulations.

As often in the Indian policy complex a number of these regulations served at cross-purposes. Their general effect, however, was to maintain oilseed prices from 20 to 30 percent above those of competing crops, while at the same time farm gate prices for all crops were probably at a disadvantage to those of industry and manufacturing.. The elimination or attenuation of many of these measures resulted in the subsequent decline in oilseed prices or a return, if you like, to a more normal relationship to the prices of other crops. Again the main factor in the reduction of prices, as in their initial rise, was the import regime for vegetable oil under which tariffs declined progressively from 65 percent (45 WTO binding) to 15 percent ad valorem currently. Even more important than the high ad valorem tariffs in the earlier period was the channeling of imports through the STC, effectively creating a non-tariff barrier to commercial imports. This changed in the mid- 90's with vegetable oils becoming part of the "open general license" regime and consequently becoming free for commercial importation.

Given the rapid fall in self-sufficiency in vegetable oil one might argue that the elimination of the policy measures was ill advised. However, a careful examination

[25] World Bank, Country Economic Memorandum, op cit., p74.

seems to indicate that the easy gains in productivity had been achieved in the oilseeds sector and that future price protection for the industry would constitute more of a windfall than an inducement to further growth. Growth at market prices will now occur in competition with other crops for which the Indian consumer also has sore need. Favoring oilseeds at this point in time would most likely occur to the detriment of area devoted to grains, cotton and sugar all of which crops have their place in a sound agricultural economy.

The World Bank's exhaustive two volume study of the oilseed sector addressed the causes of the increase in oilseed production and the possibility of future increases as follows:[26]

> "It is likely, however, that the high oilseed prices by contributing to the rapid area expansion, also caused the expansion of oilseed production into areas where oilseeds are likely to have a more limited comparative advantage. This is particularly true between 1988/89 and 1992/93 when oilseed prices increased rapidly, in particular with respect to wheat and a lesser extent coarse cereals. The rapid expansion in oilseed production observed between 1986/87 and 1993/94 reflects in part the substitution of land away from competing and more efficient crops in areas where oilseeds have less of a comparative advantage. These areas with a marginal comparative advantage in oilseed production are likely to revert back to other competing crops as oilseed prices decline after 1992/93."

The area constraints emerging in Indian agriculture are important in understanding the constructive role PL480 vegetable oil imports play. A number of factors in the present context have resulted in record commercial imports and a troubled domestic vegetable oil market. A growing population, expanded middle class and lower prices has led to rapidly increasing vegetable oil consumption and a dramatic rise in imports. Lower world prices and the more liberal trade regime have caused a decline in domestic prices and production which has fueled this increase. A very widely reported case of domestic rapeseed oil adulteration resulted in a temporary perturbation of the domestic market, caused a decline in farm plantings and pressured upward domestic vegetable oil prices at the same time that palm oil prices and availability on the international market were growing due to the Asian economic crisis. The lack of domestic seed has also reduced domestic crushing and export of vegetable oil meals somewhat, as may be seen in the 2 mln. MT decline in kharif crush in Table XII below.

The resulting trade imbalance in the oilseed sector has reverted from positive to a growing negative balance. A new measure set to go into force in 1999 would restrict the sale of vegetable oil to oil sold in sealed containers. This could further perturb the market, as much retail oil is now sold in open containers and in variable quantity to the buyer.

[26] World Bank, India: The Indian Oilseed Complex: Capturing Market Opportunities, op cit, Vol.II, Annex 2 p. 6.

TABLE XII: INDIA: Estimated Vegetable Oil Availability, by season

	1998 –1999 Season					1997 – 1998 Season			
Oilseeds	% Oil	Seed Grown -Kharif	Kharif Crush	Rabi Crush	Oil (MT)	Seed Grown	Kharif Crush	Rabi Crush	Oil (MT)
Groundnut	40	52.6	27.3	NA	10.9	70.5	30.6	7.8	15.4
Soya	17	58.1	51.1	NA	8.7	55.0	49.5	- -	8.4
Rape	33	1.0	1.0	NA	0.8	50.5	1.5	47.5	16.2
Sunflower	35	2.7	2.7	NA	1.0	12.1	2.7	9.4	4.2
Sesame	45	5.4	3.4	NA	1.5	7.9	4.5	1.9	2.9
Castor	42	9.2	9.2	NA	3.9	8.0	8.0	- -	3.4
Niger	30	1.5	1.3	NA	0.4	1.4	1.4	- -	0.4
Safflower	30	- -				2.3	- -	2.3	0.7
Linseed	43	- -				2.9	- -	2.9	1.2
Cottonseed	11				4.8	48.3	38.3	- -	4.2
Copra	65	7.5	7.5	NA	4.9	7.0	7.0	- -	4.6
Sub Total		130.5	96.0	NA	26.7	210.6	98.2	71.8	52.8
Rice Bran	15				5.0				5.0
Rape Cake	9				0.9				0.9
Sun Cake	12				0.6				0.6
G Cake	7				0.7				0.8
Cotton C	7				0.4				0.6
Minorseeds					0.5				0.5
Sub Total					8.7				8.4
Grand Total					45.1		143.5	71.8	70.0

PL 480 VEGETABLE OIL

Shipments of PL 480 vegetable oil to India reached approximately 20,000 MT for direct feeding and 5,000 MT monetized in FY'98. PL 480 vegetable oil constitutes less than 2 percent of Indian imports and less than 0.2 percent of total consumption. Sales in recent years have gone to the private sector with the State Trading Corporation (STC) acting as agent, organizing a twice weekly tender process.

In 1997 refined soyabean oil totaling of 6,756 MT was shipped for the monetization program managed by CARE. Total cost and freight (C & F) value of the commodities came to $5.8 mln. As a result of the sale, proceeds equal to 90 % of the C &F value (112.66 % FAS) were realized for the soybean oil. In FY'98 under a similar program 4,810 MT of crude cannola was imported. Total cost and freight (C&F) of $3.4 mln. was realized, 105.56 % C & F value (117.34 % FAS) for the cannola. Although difficulties with the sales and the STC occurred in the early stages of these programs market prices were finally obtained.

While the quantities of PL 480 vegetable oil dstributed in India are too small to affect overall pricing and farmer's planting intentions, sales at below market prices can create windfalls for traders and result in lower proceeds for U.S. development programs. Attention should therefore continue to be given to insist on market pricing and transparent sales procedures as with the recent sales reviewed in the course of this study.

Some seasonality can be observed in the pricing of vegetable oil in India with peak prices coming during the festival period in the spring and summer. Prices are lowest after the Rabi crop in February and March. Annual variation was found to be of the magnitude of 10 % for soybean oil in 1993 but is declining with increased openness of the market and increasing importance of foreign supplies.[27]

Crushing capacity is in surplus for practically all oilseeds in India with crush achieving only 30 % of effective capacity, on average[28]. For this reason the industry greatly prefers U.S. PL 480 of crude degummed vegetable oil which will undergo further refining and local value added before being sold on the Indian market. Refined oils are more likely to benefit local traders.

[27] Scott, William E., Evaluation of PL 480 India Title III Auction Mechanisms, USAID, New Delhi, Dec. 1993 p.6.
[28] World Bank, India The Indian Oilseed Complex, op cit.

CONCLUSIONS

The India PL 480 Title II program is the largest program worldwide, representing about one-quarter of Title II development resources. Even at this level of commitment the India program underweights the country's share of the world's malnourished. Many questions abound in considering a program's expansion. Many of the most important considerations derive from the results oriented nature of USAID's commitment. Is the GOI commited to the same goals of "food security" that are embodied in our programs? Has it confirmed this commitment with appropriate resources and policies. Are the intermediate level results of USAID's India Mission's Strategic Objective(SO)-3 "Increased Child Survival and Nutrition in Selected Areas of India", being addressed effectively by reliable cooperating sponsors? These are all questions which go beyond the scope of a Bellmon determination.

What we are asked to look at here is the equally important question of the relationship of PL480's investment in donated food to the host country's capacity to produce and market food on its own. This question involves understanding of the complex social relationships involved in the economy of food production and consumption. Issues of demand, nutrition, income, production, technology, trade and markets must all be examined and understood if a determination is to adequately reflect the dynamic situation of the developing country.

India has successfully used donated food as the basis for investment in its agricultural sector in the past. Because of the relatively small size of the U.S. program in terms of Indian demand for food, especially of the more sensitive monetized portion; because the large portion of the food which is directly fed goes to population groups representing some of the world's most severely mal-nourished; and, because neither the technology nor resources available to Indian agriculture will allow it under any easily accesible price or policy scenario to supplement PL 480 resources with local production, we are able to conclude positively this Bellmon determination. At current levels, or at the modestly increased levels of direct feeding and monetization contemplated, there is no adverse affect of U.S. commodities on local agricultural production or markets.